NAVSEA DAHLGREN
Surface Warfare Center Division

NDIA
NATIONAL DEFENSE INDUSTRIAL ASSOCIATION
STRENGTH THROUGH INDUSTRY & TECHNOLOGY

GIF
Guidance Integrated Fuze

NSWCDD G34 Fuze Branch

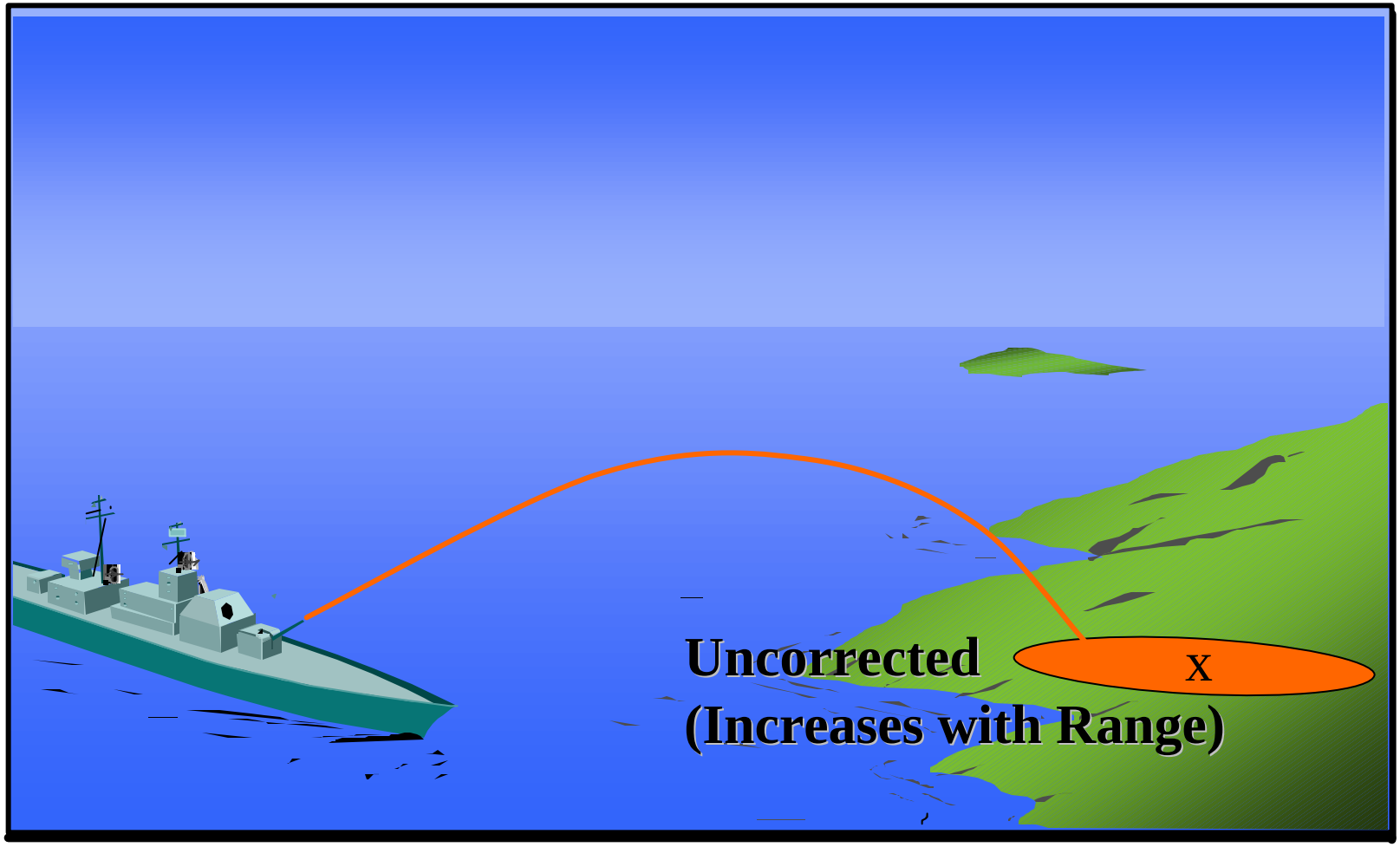
Mark Engel

Keith Lewis

Howie Wendt

NAVSEA DAHLGREN
Surface Warfare Center Division

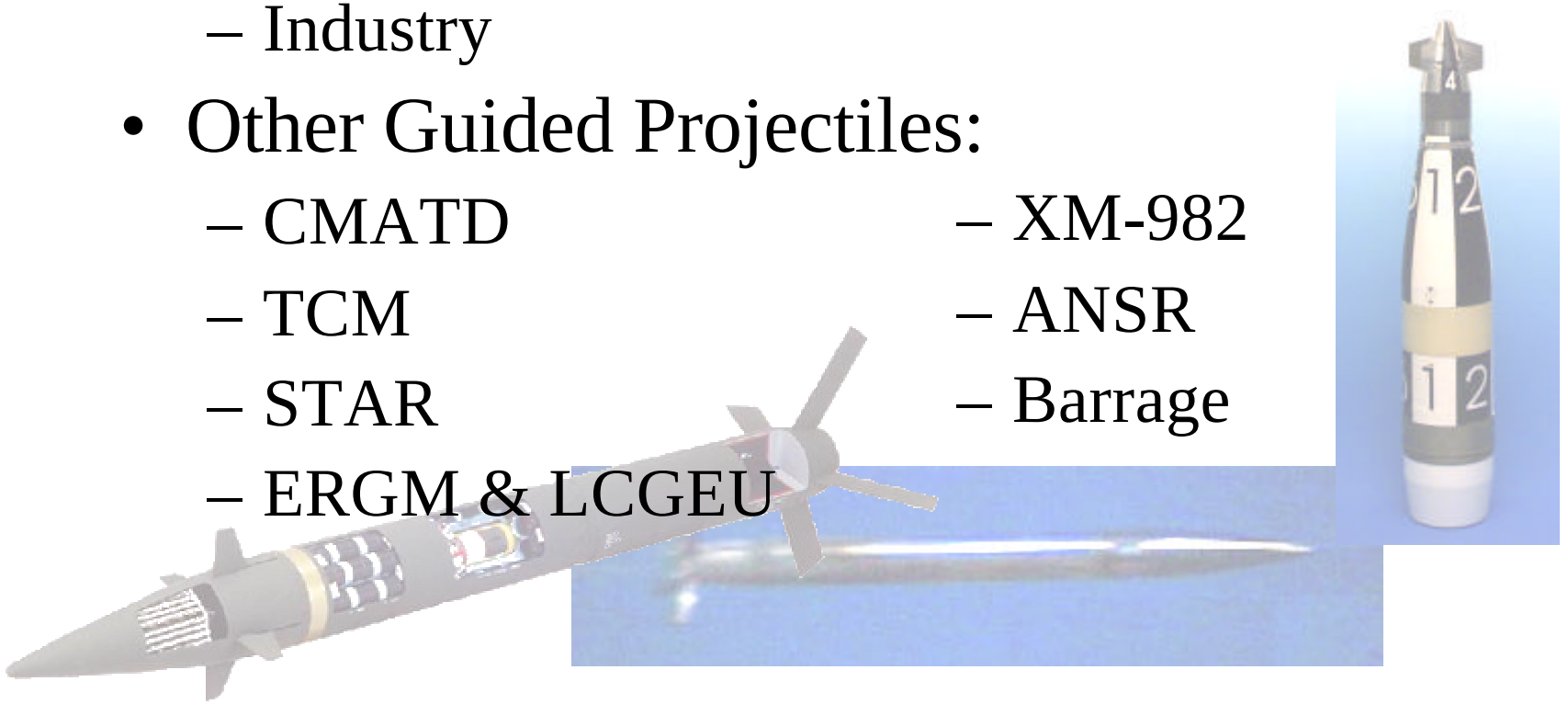
Inaccuracy



NAVSEA DAHLGREN
Surface Warfare Center Division

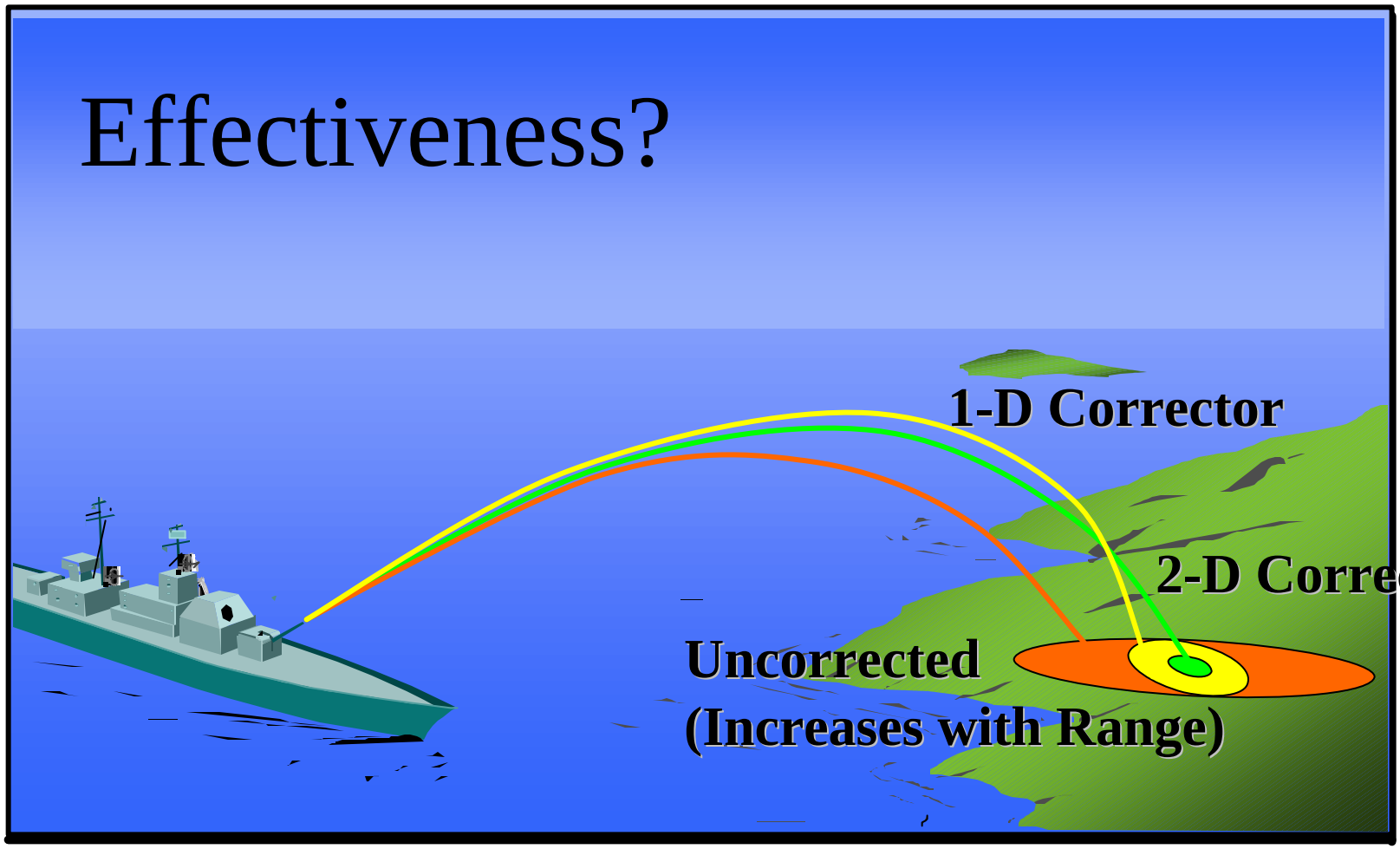
Background

- Why? Improved Accuracy
- Who?
  - US Army, US Navy, Foreign Services
  - Industry
- Other Guided Projectiles:
  - CMATD
  - TCM
  - STAR
  - ERGM & LCGEU
  - XM-982
  - ANSR
  - Barrage



NAVSEA DAHLGREN
Surface Warfare Center Division

1-D vs. 2-D



NAVSEA DAHLGREN
Surface Warfare Center Division

Approach

- 1-D vs. 2-D? Team Star examining 1-D
- Can Canards Give Acceptable Control Authority?
- Will it Fit?

NAVSEA DAHLGREN
Surface Warfare Center Division

Control Authority?

ARDEC (Picatinny) Analyzing Trajectories with Canards

- ✓ Incorporated CMATD Aero into 7-DOF
- ✓ Compared Sample Runs with Draper 7-DOF

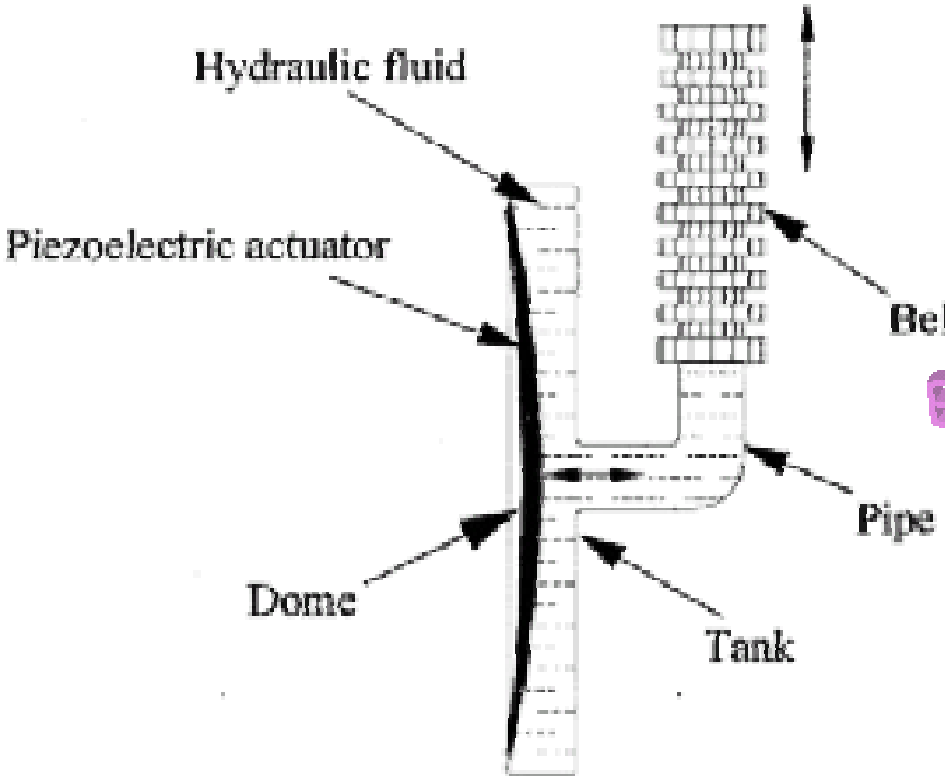
- ! Implementing Closed-Loop CMATD Guidance Algorithms

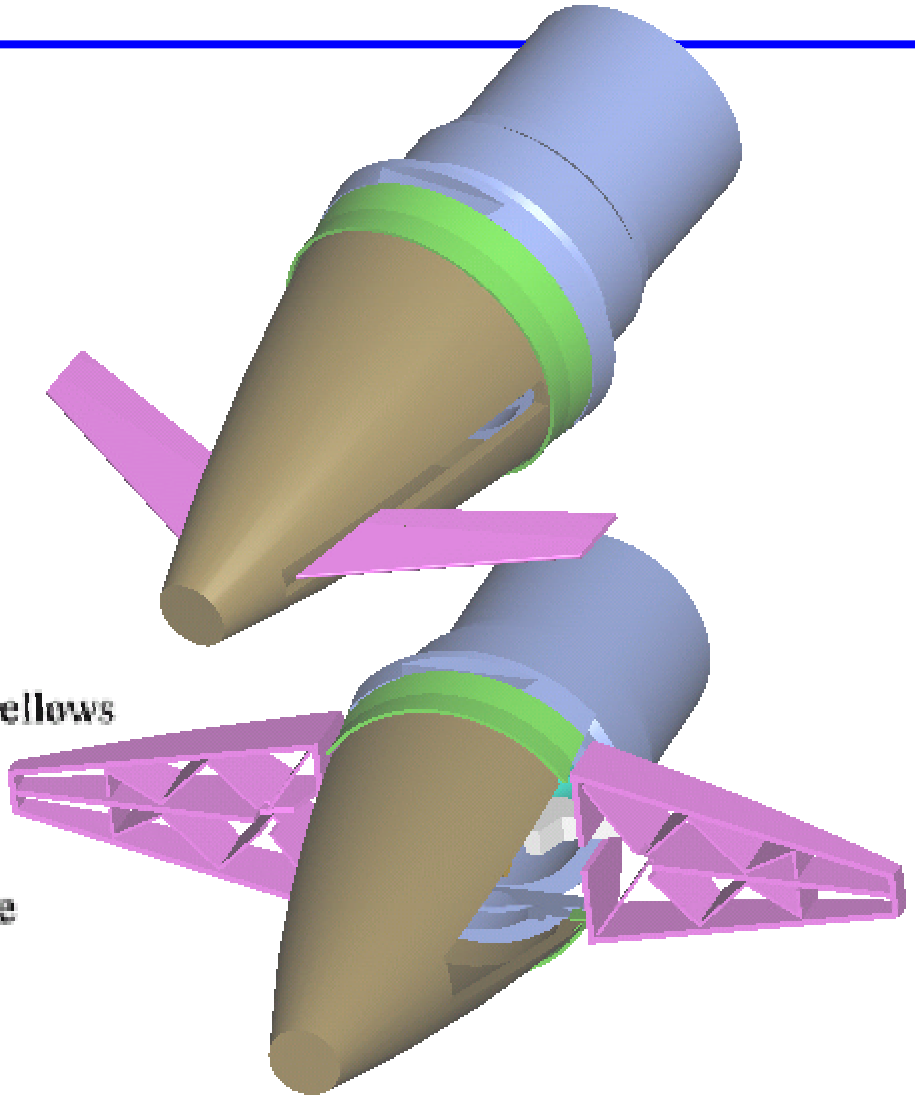
- ➢ Simulate CMATD Flights for Check
- ➢ Incorporate GIF Canards
- ➢ Simulate GIF Flight for Maximum Control Authority

NAVSEA DAHLGREN
Surface Warfare Center Division

First Step - Canards

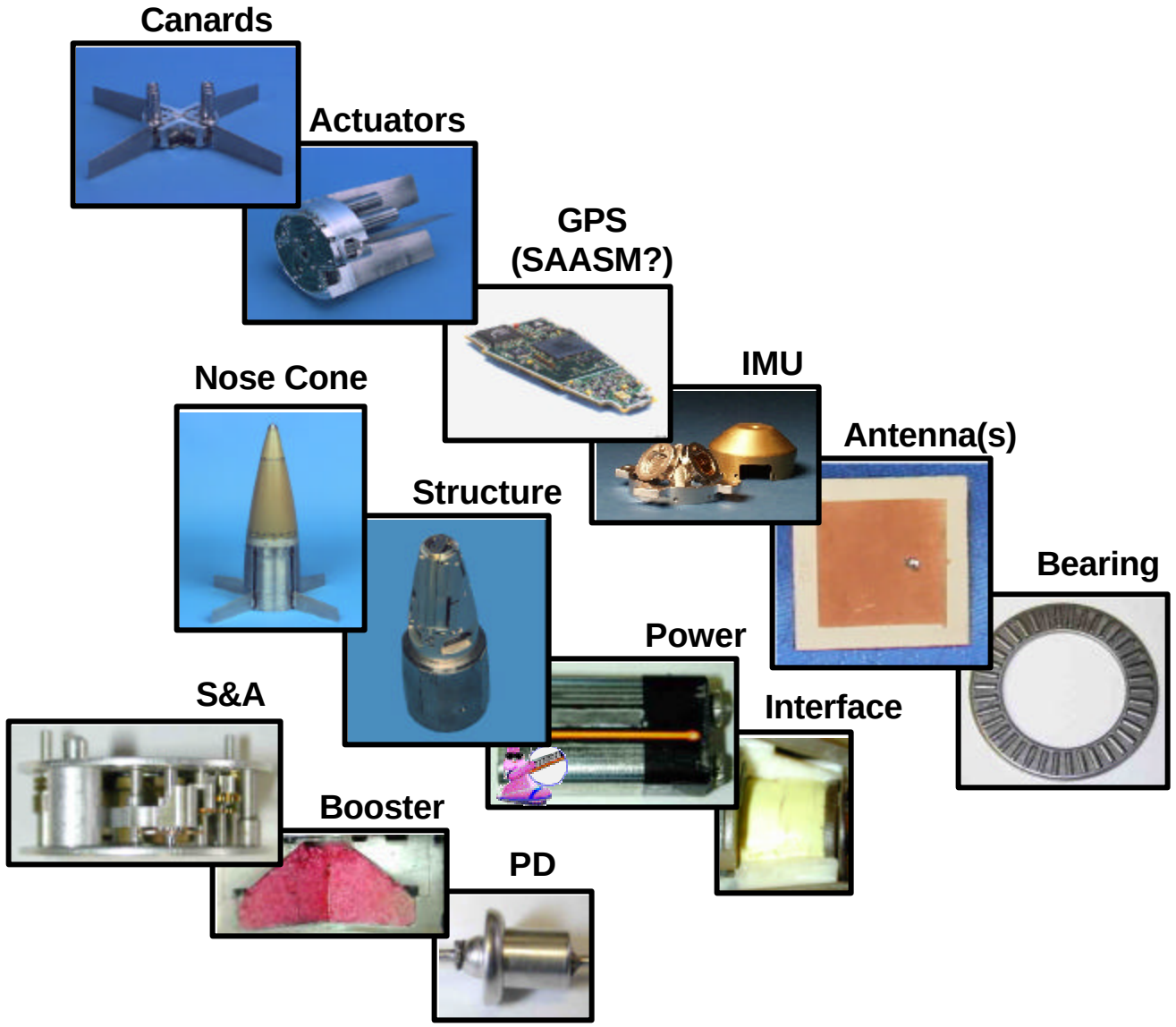
- Canards
- Actuators

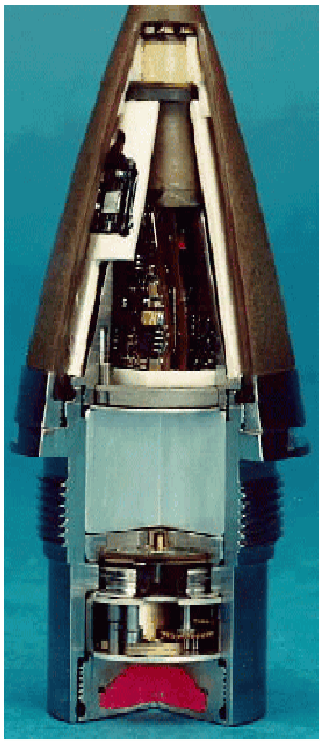




NAVSEA DAHLGREN
Surface Warfare Center Division

Fit It In 9 Cubic Inches



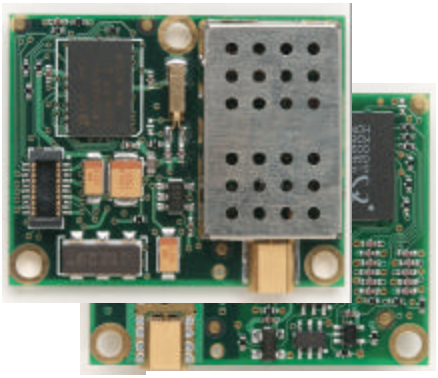
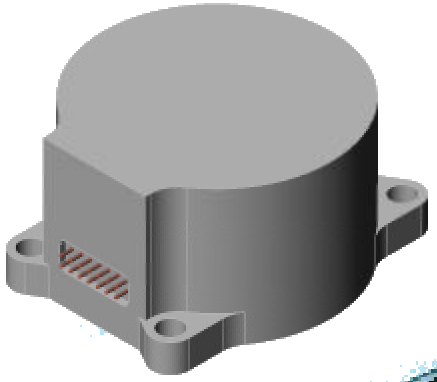
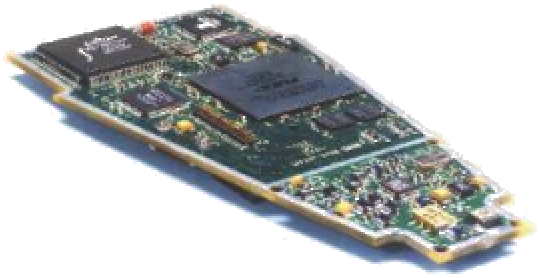


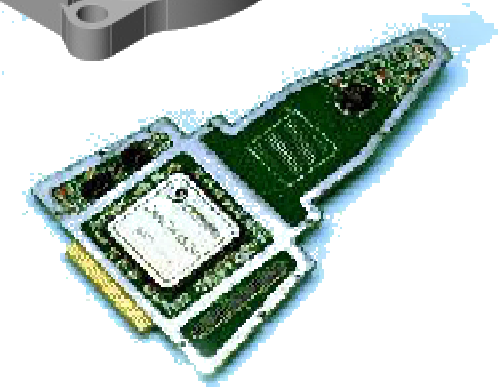
NATO Standard Fuze

NAVSEA DAHLGREN
Surface Warfare Center Division

GPS/INS

- Looking for Existing Technology
- Looking for Future Technology



NAVSEA DAHLGREN
Surface Warfare Center Division

Other Issues

- Battery vs. Generator
- MEMS S&A (but micro detonators?)
- Rolling Canards
- Single vs. Multiple Antennas
- Power Before Flight

NAVSEA DAHLGREN
Surface Warfare Center Division

Near Term Plan

- Trajectories to Determine Control Authority
- Realistic Volume Allocation
- Options for Power and Rolling Canards
- Collect Data on GPS, INS, Actuators